

Mat 6541 Current Topics in Mathematics Education
Credit, 3 sem. hrs.

This course will address current content topics, current method trends, and uses of technology in the secondary mathematics classroom. Trends based on research and current practices will be included.

Prerequisite: Graduate standing and intention to seek AA licensure in secondary mathematics

Rationale

Secondary mathematics teachers must be prepared to be learners as long as they are teachers. Methods and technology are changing at such a rapid pace that teachers must be made aware of what has changed since they were undergraduate students and where to obtain current information about innovative instruction techniques, new technology and content. The course is designed to include mathematics content (on a deeper level) that these teachers will be teaching to their own students.

Learning Objectives

The students will:

- Discuss alternative assessments for secondary mathematics students Explore the concept of “active learning”
- Examine the Instructional Planning Research Guides and Resources from the Mississippi Department of Education
- Read and review NCTM journal articles
- Prepare a short lesson plan unit based on current best practices (evaluated by present accreditation guidelines)
- Explain an overview of the Common Core mathematics content standards and and the mathematics practice standards and outline the thread of a secondary mathematics topic throughout the *Mississippi College-and-Career Readiness Standards* (from introduction to completion)
- Discuss the need for mathematics in a changing world and the need for continued improvement of mathematics education.
- Explore Modern Algebra and Number Theory concepts and their applications in secondary mathematics
- Solve mathematical problems (as opposed to exercises) in various mathematical fields such as algebra, geometry, and number theory

- Identify strategies used in problem solving and ways of incorporating those into a secondary mathematics classroom.
- Present and/or demonstrate ways of using technology in teaching secondary mathematics
- Create a portfolio for a senior mathematics preservice teacher to guide them in their first year of teaching and meet with various preservice teachers to instruct them in using the created portfolio.
- Use the investigative method to prove/disprove mathematical hypotheses.
- Write mathematical proofs
- Read *Mathematics for Human Flourishing* by Francis Su (working various problems presented in the text) and discuss ways of incorporating ideas in the book in your classroom.

Academic Integrity

Honesty and integrity are basic virtues expected of all students at Mississippi College. *The Mississippi College Undergraduate Catalog* lists the policies and penalties for plagiarism and cheating. On tests, quizzes, and individual out-of-class projects, the work is assumed to be the student's own and no cheating will be tolerated.

Topics to be addressed include:

Learning theories and styles

Curriculum sources – NCTM resources, *Mississippi College-and-Career Readiness Standards*

Curriculum Assessment - alternative, performance based, writing in mathematics

Planning for teaching - large group, small group, individual

Teaching diverse student populations - equity issues and ways to address those

Skills in Teaching Mathematics - questioning, motivation, vocabulary, cooperative learning, technology use,

Teaching problem solving

Teaching higher order thinking

Teaching secondary mathematics content

Conceptual understanding vs. algorithm application

Active learning

Methods of Instruction

The methods of instruction include class discussion of text and journal articles, lecture, class demonstration (both student and teacher), student presentations, modeling using manipulatives, technology demonstrations, and group problem solving (both large and small).

Required Practices

Students will read, discuss, and summarize current research articles in mathematics, demonstrate manipulative use, complete written homework assignments, review videos, utilize software, participate in discussions, write a small lesson plan unit and teach one of the lessons to the class, create a portfolio, and take two tests (a midterm and a final).

Instructional Materials

Texts: *Principles to Action: Ensuring Mathematical Success for All* (can be purchased on Amazon or on the NCTM website (nctm.org)).

Mathematics for Human Flourishing by Francis Su

Assessment

Assessment of students' progress will be made based on total points accumulated through the following activities: homework, journal writing, professional journal article summaries, a midterm examination, a final examination, class participation, group problem solving, individual problem solving, lesson presentations, lesson plan unit, video summaries, and software use. Final grades will be made on percent of total points as follows:

90-100% of the total points = A
80-89% of the total points = B
70-79% of the total points = C
60-69% of the total points = D
less than 60% of the total points = F.

Other policies

- Attendance: You are expected to be in class **on time and prepared!** The college stipulates that the grade for the course is an F in the event of 6 absences in a summer school class.
- Makeup work: This is the responsibility of the student and should be cleared with the professor in advance when possible. It will only be allowed for excused absences
- Special Accommodations: If you need special accommodations due to learning, physical, psychological, or other disabilities, please contact Student Counseling Services at 601-9257791